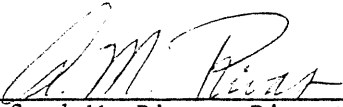


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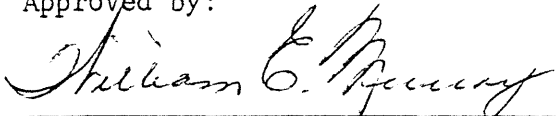
BIOLOGICAL EVALUATION
LARCH CASEBEARER
PAYETTE AND BOISE NATIONAL FORESTS
1977

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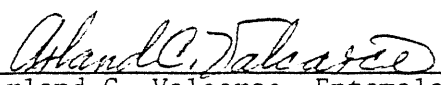
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BIOLOGICAL EVALUATION

LARCH CASEBEARER

PAYETTE AND BOISE NATIONAL FORESTS - 1977

INTRODUCTION

Larch casebearer, Coleophora laricella (Hubner), was found for the first time south of Idaho's main Salmon River in early spring of 1977 by Malcolm Furniss, Research Entomologist, Moscow, Idaho. Larch casebearer, indigenous to Europe, was discovered in North America in Massachusetts in 1886 (Denton and Tunnock, 1971). The pest spread throughout the range of eastern larch, Larix laricina (Du Roi) K. Koch. It appeared in northern Idaho in 1957 and by 1970 had spread to western Montana, eastern Washington, Oregon, and British Columbia, infesting western larch, Larix occidentalis Nutt., throughout nearly half its natural range.

A survey was conducted subsequent to discovery of the pest south of the Salmon River to determine: (1) extent of the infestation throughout the southern range of larch in Idaho, (2) infestation intensity, and (3) level of parasitism.

GENERAL INFORMATION

Insect: Larch casebearer, Coleophora laricella (Hubner).

Host Tree: Western larch, Larix occidentalis Nutt.

Location: Throughout western larch stands on the Payette and Boise National Forests, other federal, state and private forested lands.

Type of Damage: Light defoliation with potential for increased intensity at elevations below 4,500 feet; also increment loss and increased susceptibility to other tree mortality agents.

Extent of Infestation: Throughout the natural range of western larch south of the Salmon River in Idaho.

SURVEY METHODS

Preliminary field samples were collected in early June 1977 to determine pupation of spring feeding larch casebearer larvae. The survey was conducted June 6-8 using the linear measurement technique for sampling the pupal stage (Theroux and Long, 1975). Ten trees at each of 10 locations representing western larch stands on the Payette and Boise National Forests were sampled for larch casebearer (Figure 1). Dominant or codominant trees 30 to 50 feet tall were selected. Four branches, one from each quadrant, were cut from mid-crown. Casebearer pupae were counted on 100 needle fascicles per branch. This sample consisted of approximately 36 linear inches of the branch tip. All larch casebearer infested twigs collected during the survey were reared for parasites in quart-size ice cream cartons with glass vial windows.

BIOLOGICAL INFORMATION

A brief description of life cycle and damage taken from Denton and Tunnock (1971) follows: Larch casebearer overwinters as a third instar larva, inside a case made from a hollow needle. In the spring they become active and begin feeding by mining new needles. During late May and early June pupation takes place. New adults emerge in July. Eggs, which number about 50 per female, are laid singly on the needles. Eggs hatch and larvae mine into needles from points of egg attachment. Feeding continues for about two months until frost during which time the larvae form mobile cases from larch needles. In the fall, when larch defoliates, casebearer larvae congregate on twigs to overwinter. Feeding begins when the weather warms again in April. Severe defoliation for four or more years can kill trees. Weakened by larch casebearer, trees become susceptible to other damaging agents. Seriously damaged and dead trees may be seen on thousands of acres in northern Idaho.

RESULTS

Results of the survey showed larch casebearer infests all western larch stands in the Intermountain Region at endemic levels. However, some of the lower elevation stands showed greater potential for population buildups; individual trees showed moderately visible defoliation. Populations of the pupal form averaged 3 larch casebearer per 100 needle fascicles and ranged from .03 larch casebearer at Freight Landing, elevation 6,451', to 12 larch casebearer at Goose Creek, elevation 3,900', Table 1. Parasitization of larch casebearer pupae averaged 7 percent and ranged from 0 to 11 at the ten sample locations. Six native species of wasp parasites or hyperparasites were reared from a collection of 1,189 larch casebearer pupae, Table 2.

DISCUSSION

Based upon population density and predicted defoliation categories of negligible, light, moderate and heavy (Ciesla and Bousfield, 1974), all samples produced ratings of negligible except one, Goose Creek, which was light. Even though populations were insignificant to light, highest numbers were found at the lowest elevation, Goose Creek, and lowest numbers at the highest elevation, Freight Landing, Table 1.

Denton feels that larch casebearer in the Intermountain Region may not become a problem in high elevation stands above about 4,000 to 4,500 feet (personal communication).

Native western parasites have shown low levels of natural control of larch casebearer except in local areas. However, researchers have attained promising natural control results from the introduction and establishment of exotic parasites including those of European origin. Among the exotic parasites that have been introduced into western larch stands in Idaho, Montana, Oregon, and Washington, the small wasps Agathis pumila (Ratz.) (Hymenoptera: Braconidae) and Chrysocharis laricinellae (Ratz.) (Hymenoptera: Eulophidae) have shown special promise for biological control. A. pumila, C. laricinellae and other exotics could be introduced into lower elevation larch stands south of the Salmon River by transporting larch casebearer infested tree branches from northern Idaho during the insect's overwintering and pupal periods. Work would be conducted in cooperation with the Intermountain Forest and Range Experiment Station, Forestry Sciences Laboratory, Moscow, Idaho.

RECOMMENDATIONS

(1) FIDM conduct a population and damage survey in 1978 for trend purposes.

(2) FIDM collect parasites and introduce them to parasite free populations as agreed with land managers.

Table 1. Larch Casebearer Survey Summary, Payette and Boise
National Forests, Idaho, 1977.

	<u>Elevation (feet)</u>	<u>LCB pupae/100 fascicles</u>	<u>Percent parasitism</u>
Goose Creek	3900	12.13	6.2
Lower Boulder Creek	4000	6.65	11.3
Tamarack	4104	2.65	4.9
Smiths Ferry	4536	2.03	3.7
Fall Creek	4900	2.98	9.2
Payette Lake	5006	0.55	-0-
Robb Spring	5209	1.30	1.9
Fourth of July Creek	5300	1.33	9.4
Upper Boulder Creek	5800	0.23	-0-
Freight Landing	6451	0.03	-0-
Means	4921	2.97*	7.0**

* $\frac{1189 \text{ pupae}}{40,000 \text{ fascicles} \times 100}$

** $\frac{82 \text{ parasites}}{1189 \text{ pupae}}$

Table 2. Geographic Distribution of Parasites*

	<u>Number Reared</u>	<u>Location</u>
<u>Gelis tenellus</u> (Say)	2	Smiths Ferry
	1	Fourth of July Cr.
	2	Tamarack
	6	L. Boulder Cr.
<u>Spilochalcis albifrons</u> (Walsh)	1	Smiths Ferry
	1	Fourth of July Cr.
	1	Tamarack
	1	Robb Spring (Cascade)
	23	L. Boulder Cr.
	11	Fall Creek
	19	Goose Creek
<u>Bracon pygmaeus</u> Prov.	1	Fourth of July Cr.
	4	Goose Creek
<u>Dicladocerus nearcticus</u>	1	Fourth of July Cr.
<u>Pristomerus</u> spp.	1	Fourth of July Cr.
	2	Tamarack
	1	L. Boulder Cr.
	1	Goose Creek
<u>Scambus</u> (<u>scambus</u>) <u>decorus</u> Wly.	2	L. Boulder Cr.
	1	Fall Creek

*Parasites were identified by Leon Theroux, Biological Technician
Intermountain Forest and Range Experiment Station, Forestry Sciences
Laboratory, Moscow, Idaho.

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